

IN THE CLAIMS:

The following listing of claims replaces all previous claim listings and versions.

Claim 1. (Currently Amended) A mobile terminal connectable in a mobile mode between an infrastructure network and an ad hoc network, said infrastructure network being a permanent network interconnected via a relay node, said ad hoc network being a temporary network formed of only plural mobile terminals, said infrastructure network having plural mobile terminals, relay nodes, and a server which provides information needed for connection of mobile terminals,

wherein an infrastructure network connection procedure and an ad hoc network connection procedure are configured in an integrated mode in an address management process, a connection network identification process and a destination address capture process which are needed when said mobile terminal is connected to a network to establish communications,

wherein each process includes identifying whether a network to which said mobile terminal is connected is the ad hoc network or the infrastructure network and then using a procedure corresponding to the connected network, and

a first counter configured to perform a reset operation by receiving an ad hoc network advertisement message receive signal and a reset signal, to count, as a first count when said reset signal is input, a number of ad hoc network advertisement messages, and to output the first count;

a second counter configured to perform a reset operation by receiving an

infrastructure network advertisement message receive signal and a reset signal, to count, as a second count when said reset signal is input, a number of infrastructure network advertisement messages, and to output the second count;

a timer configured to measure a predetermined period of time and to output said reset signal when a time-out occurs;

a first comparator configured to compare the first count with zero, and to output a comparison result as said infrastructure network connection signal to a decoder; and

a second comparator configured to compare the second count with zero, and to output the comparison result as said ad hoc network connection signal to said decoder, said decoder being configured to determine whether said mobile terminal has moved between the infrastructure network and the ad hoc network based on the received infrastructure connection signal and the received ad hoc network connection signal.

Claim 2. (Currently Amended) A mobile terminal connectable in a mobile mode between an infrastructure network and an ad hoc network, said infrastructure network being a permanent network interconnected via a relay node, said ad hoc network being a temporary network formed of a plurality of mobile networked terminals, said infrastructure network having a plurality of mobile terminals, relay nodes, and a server which provides information needed for connection of mobile terminals, said mobile terminal comprising:

receive packet input means for inputting as a receive packet a packet transmitted onto a communication medium configuring a network to be connected;

transmission packet output means for transmitting a transmission packet onto said communication medium;

means for inputting an opposite communication party's name to said mobile terminal ;

means for outputting a destination address corresponding to said opposite communication party's name;

address management means for receiving said receive packet, for identifying whether said network to be connected is said infrastructure network or said ad hoc network, and for transmitting said transmission packet which captures and manages an address used in said network;

destination address capture means for receiving said receive packet, for identifying whether network to be connected is said infrastructure network or said ad hoc network, for outputting said transmission packet to capture said destination address corresponding to said opposite communication party's name, and for obtaining a destination address of said opposite communication party's name;

move management means for receiving said receive packet and outputting said transmission packet to manage whether or not said movable terminal has moved from said network to be connected to another network;

a first counter configured to perform a reset operation when said reset signal is input by receiving an ad hoc network advertisement message receive signal and a reset signal to count, as a first count, a number of ad hoc network advertisement messages, and to output the first count;

a second counter configured to perform a reset operation by receiving an

infrastructure network advertisement message receive signal and a reset signal, to count, as a second count a number of infrastructure network advertisement messages, and to output the second count when said reset signal is input;

a timer configured to measure a predetermined period of time and to output said reset signal when a time-out occurs;

a first comparator configured to compare the first count with zero, and to output a comparison result as said infrastructure network connection signal to a decoder; and

a second comparator configured to compare the second count with zero, and to output the comparison result as said ad hoc network connection signal to said decoder, said decoder being configured to determine whether said mobile terminal has moved between the infrastructure network and the ad hoc network based on the received infrastructure connection signal and the received ad hoc network connection signal.

Claim 3. (Currently Amended) The mobile terminal defined in claim 2, wherein said address management means comprises:

a. ad hoc/ infrastructure network identification means for identifying whether or not a network to be connected by said mobile terminal itself is said infrastructure network or said ad hoc network in response to said receive packet, for outputting a network identification signal representing a network to which a network to be connected by said mobile terminal itself is connected, for outputting an infrastructure network connection signal when said network to be connected is said infrastructure network, and for outputting an ad hoc network connection signal when said network to ~~be~~ be connected is said ad hoc network;

b. infrastructure network address management means for receiving said receive packet and said infrastructure network connection signal, for outputting necessary transmission data as said transmission packet, and for managing an address used by said mobile terminal itself when a network to be connected by said mobile terminal itself is an infrastructure network;

c. ad hoc network address management means for receiving said receive packet and said ad hoc network connection signal, for outputting necessary data as said transmission packet, and for managing an address used by said mobile terminal itself when said network to be connected by said mobile terminal itself is an ad hoc network; and

d. a switch for receiving said network identification signal, said transmission packet from said infrastructure network address management means, and said transmission packet from said ad hoc network address management means, for selectively outputting said transmission packet from said infrastructure network address management means by said network identification signal when a network in a connection state to said mobile terminal itself is an infrastructure network, and for selectively outputting said transmission packet from said ad hoc network address management means when said network in a connection state is an ad hoc network.

Claim 4. (Currently Amended) The mobile terminal defined in claim 3, wherein said ad hoc/ infrastructure network identification means comprises:

infrastructure network advertisement message receive means for
Receiving an infrastructure network advertisement message containing a network address of an infrastructure in response to said receive packet and for outputting an infrastructure network

advertisement message receive signal representing that said infrastructure network advertisement message has been received when said infrastructure network advertisement message contains a network address equal to a network address of a network connected to said mobile terminal;

ad hoc network advertisement message receive means for receiving an ad hoc network advertisement message containing a network address of an ad hoc network in response to said receive packet and for outputting an ad hoc network advertisement message receive signal representing that said ad hoc network advertisement message has been received when said ad hoc network advertisement message contains a network address equal to a network address of a network connected to said mobile terminal;

an adder for adding an output from said first counter and an output from said second counter;

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and

a third comparator for comparing the output from said adder with zero to obtain a result and outputting said result to said decoder which creates said network identification signal and to an encoder which creates said ad hoc network connection signal;

said decoder receiving signals from said first, said second, and said third comparators to create an infrastructure or ad hoc network connection signal;

said encoder receiving signals from said second and said third comparators-and then encoding said ad hoc network connection signal representing whether or not said mobile terminal configures a new ad hoc network or said mobile terminal itself is connected to an existing ad hoc network, based on said input signal.

Claim 5. (Previously Presented) The mobile terminal defined in claim 3, wherein said ad hoc network address management means comprises:

a. ad hoc network/ network address management means for receiving said receive packet and said ad hoc network connection signal, outputting a message requesting a network address containing a network address used in a new ad hoc network when a new ad hoc network is configured for connection as said transmission packet and a message representing a spent network address when said ad hoc network/ network address request message containing said spent network address in an ad hoc network connected by said mobile terminal itself has been received, capturing a network address of an ad hoc network to which said mobile terminal itself is connected, based on said receive packet, outputting a network address captured signal representing that the captured network address and the network address have been captured, and managing said captured network address not to be used in an overlap mode; and

b. an hoc network/ terminal address management means for receiving said receive packet, said ad hoc network connection signal, said captured network address, and said network address captured signal, outputting as said transmission packet a message requesting a terminal address list being used in said ad hoc network when said mobile terminal is connected to an existing ad hoc network and a message containing said terminal address list held by said mobile terminal itself in response to said address list requesting message, capturing a terminal address used in ad hoc network to be connected by said mobile terminal itself, based on said receive packet and said ad hoc network connection signal, and acknowledging a terminal address to be used in said ad hoc network connected by said mobile terminal itself.

Claim 6. (Previously Presented) The mobile terminal defined in claim 2, wherein said destination address capture means comprises:

a. ad hoc/ infrastructure network identification means for receiving said receive packet, identifying whether or not a network to which said mobile terminal is connected is said infrastructure network or said ad hoc network, outputting a network identification signal representing a network to be connected to a network connected by said mobile terminal, outputting an infrastructure network connection signal when said network to be connected is said infrastructure network, and outputting an ad hoc network connection signal when said network to be connected is said ad hoc network;

b. a first switch for receiving the name of said opposite communication party's name of said mobile terminal itself and said network identification signal and selecting a destination of said opposite communication party's name based on said network identification signal;

c. infrastructure network/ destination address capture means for receiving said infrastructure network connection signal and said opposite communication party's name, transmitting a message requesting a terminal address corresponding to said communication opponent's name, detecting a message containing a terminal address corresponding to said opposite communication party's name from said receive packet, and outputting said terminal address corresponding to said opposite communication party's name;

d. ad hoc network/ destination address capture means for receiving said ad hoc network connection signal and said opposite communication party's name, transmitting a message requesting a terminal address corresponding to said opposite communication party's name, detecting a message containing a terminal address corresponding

to said opposite communication party's name from said receive packet, and outputting said terminal address corresponding to said opposite communication party's name;

e. a second switch for selectively outputting a terminal address corresponding to said opposite communication party's name captured by said infrastructure network destination address capture means and a terminal address corresponding to said opposite communication party's name captured by said ad hoc network/ destination address capture means, based on said network identification signal; and

f. a third switch for selectively transmitting a message requesting a terminal address corresponding to said opposite communication party's name captured by said infrastructure network/ destination address capture means and a message requesting a terminal address corresponding to said opposite communication party's name captured by said ad hoc/ destination address capture means, based on said network identification signal.

Claim 7. (Previously Presented) The mobile terminal defined in claim 6, wherein said ad hoc network/ destination address capture means comprises:

a. destination terminal address detection means for receiving said network identification signal, starting up when a connection network of said mobile terminal itself is an ad hoc network, receiving said receive packet and said opposite communication party's name, outputting the terminal address of said opposite communication party's name by detecting a destination address message containing correspondence relationships between said opposite communication party's name and said opposite communication party's terminal address from said receive packet, and outputting a terminal address capture signal of said opposite communication party;

b. destination terminal address request message output means for receiving said opposite communication party's name, broadcasting as said transmission packet a message requesting the correspondence relationship between said opposite communication party's name and said opposite communication party's terminal to a communication medium in which a connection network of said mobile terminal itself configures an ad hoc network, and outputting a timer start-up signal;

c. a timer for starting measuring a predetermined period of time in response to said timer start-up signal, ceasing measurement of said predetermined period of time when a terminal address capture signal of said opposite communication party is received during measuring said predetermined period of time, and outputting a time-out signal representing a timeout when the measurement of said predetermined period of time ends;

d. terminal address non-capture detection means for outputting a terminal address non-capture signal representing that a terminal address corresponding to said opposite communication party's name cannot be captured, when said time-out signal is received;

e. a control circuit for outputting a switch control pulse that selects said terminal address non-capture signal when said time-out signal is input and selects a terminal address capture signal of said opposite communication party when a terminal address capture signal of said opposite communication party is input;

f. a switch for selectively outputting said terminal address non-capture signal or said terminal address capture signal of said opposite communication party, based on said switch control pulse;

g. destination terminal address request message detection means for detecting said destination terminal address request message in response to said receive packet

and then outputting said destination address message transmission request signal when said destination terminal address request message requests a terminal address to the name of said mobile terminal itself; and

h. destination terminal address message transmission means for broadcasting as said transmission packet said destination terminal address message containing its own terminal address to a communication medium in which a connection network of said mobile terminal configures an ad hoc network, when said destination address message transmission request signal is input.

Claim 8. (Previously Presented) The mobile terminal defined in claim 6, wherein said ad hoc/ infrastructure network identification means comprises:

infrastructure network advertisement message receive means for receiving an infrastructure network advertisement message containing a network address of an infrastructure network in response to said receive packet, and outputting an infrastructure network advertisement message receive signal representing that said infrastructure network advertisement message has been received when said infrastructure network advertisement message contains a network address equal to a network address of a network connected by said mobile terminal ;

ad hoc network advertisement receive means for receiving an ad hoc network advertisement message containing a network address of an ad hoc network in response to said receive packet, and outputting an ad hoc network advertisement message receive signal representing that said ad hoc network advertisement message has been received when said

ad hoc network advertisement message contains a network address equal to a network address of a network connected by said mobile terminal.

Claim 9. (Original) The mobile terminal defined in claim 2, wherein said mobile management means comprises:

a. network advertisement request message transmission means for detecting said infrastructure network advertisement message or said ad hoc network advertisement message containing a network address of a network to which said mobile terminal is connected, in response to said receive packet, detecting that said mobile terminal has been moved to a different network when said infrastructure network advertisement message or said ad hoc network advertisement message cannot be received for a predetermined period of time, and transmitting said infrastructure network advertisement message or said ad hoc network advertisement request message requesting the network address of said network; and

b. ad hoc network advertisement means for receiving said receive packet when a network to which said mobile terminal is connected is an ad hoc network, and transmitting said ad hoc network advertisement message representing the presence of said ad hoc -network in cooperation with another mobile terminal connected to said ad hoc network.

Claim 10. (Currently Amended) The mobile terminal defined in claim 9, wherein said network advertisement request message transmission means comprises:

infrastructure-network advertisement message receive means for receiving an infrastructure network advertisement message containing a network address of an infrastructure network in response to said receive packet, and outputting an infrastructure

network advertisement message receive signal representing that said infrastructure network advertisement message has been received when said infrastructure network advertisement message contains a network address equal to the network address of a network to which said mobile terminal itself is connected;

ad hoc network advertisement message receiving means for receiving an ad hoc network advertisement message containing a network address of an ad hoc network in response to said receive packet, and for outputting an ad hoc network advertisement message receive signal representing that said ad hoc network advertisement message has been received when said ad hoc network advertisement message contains a network address equal to a network address of a network to which said mobile terminal is connected;

an adder for adding an output from said first counter and an output from said second counter;

a comparator for comparing the output from said adder with zero to obtain a result, and outputting an advertisement message non-receive signal when said result equals zero;

infrastructure network advertisement request message transmission means for broadcasting said infrastructure network advertisement request message onto a communication medium used by said mobile terminal itself when said advertisement message non-receive signal is received; and

ad hoc network advertisement request message transmission means for broadcasting said ad hoc network advertisement request message onto the communication medium used by said mobile terminal itself when said advertisement message non-receive signal is received.

Claims 11-14. (Cancelled)

Claim 15. (Previously Presented) A mobile terminal configured to be connected in a mobile mode between an infrastructure network and an ad hoc network, said infrastructure network being a permanent network interconnected via a relay node, said ad hoc network being a temporary network formed of a plurality of terminals, said infrastructure network having a plurality of mobile terminals, relay nodes, and a server which provides information needed for connection of mobile terminals, said mobile terminal comprising:

a transmitter for transmitting a message for requesting information to the mobile terminal to be connected to said ad hoc network; and

a receiver for receiving information, which is transmitted responding to the message for requesting said information, from a terminal of the plurality of terminals of which a connection time to said ad hoc network is shortest,

wherein the mobile terminal is configured to count, as a first count, ad hoc network advertisement messages, and to count, as a second count, infrastructure network advertisement messages, and to detect whether the mobile terminal is moved from at least one of the ad hoc network and infrastructure network based on the first count and the second count.